

# ***PBEEEP***

## ***State Government***

### **Public Buildings Enhanced Energy Efficiency Program**

## **SCREENING RESULTS FOR THE STASSEN BUILDING**



**Date: 7/1/2010**

## Summary Table

Facility Name	Stassen Building
Location	600 North Robert St., St Paul, MN
Facility Manager	Gordon Specht
Number of Buildings	1
Interior Square Footage	454,392
PBEEEP Provider	Center for Energy & Environment
State's Project Manager	Ryan Allen
Date Visited	May 3, 2010
Annual Energy Cost	\$633,506 (2009)
Utility Company	Xcel Energy (Electricity) District Energy St. Paul (Hot Water & Chilled Water)
Site Energy Use Index (EUI)	67.8 kBtu/sq.ft-yr (2009)
Benchmark EUI (from B3)	98.8 kBtu/sq.ft-yr

### Recommendation for Investigation

Because of Stassen's low energy use, aggressive scheduling, and well controlled HVAC system, CEE does not recommend any further investigation.

Building Name	State ID	Area (Square Feet)	Year Built
Stassen Building	G0231023962	454,392	1998

## Stassen Building Screening Overview

The goal of screening is to select buildings where an in-depth energy investigation can be performed to identify energy savings opportunities that will generate savings with a relatively fast (1 to 5 years) and certain payback. The screening of the Stassen Building was performed by the Center for Energy and Environment (CEE) with the assistance of the facility staff. This report is the result of that information.

The Stassen Building is one large building consisting of 454,392 interior square feet. The building runs on a Honeywell EBI automation system. All equipment is on the automation system. The building was constructed in 1998. The building has never had any projects commissioned or retrocommissioned. The facility just recently had a lighting audit performed on it with energy saving recommendations as well.

There are six Air Handling Units (AHUs) in the building, four of which are very similar and serve a quarter of the building each. The two other AHUs are small and serve the elevator lobby and the basement mechanical and electrical room. There is also a data center in the building, which has dedicated cooling units and a dedicated glycol loop with dry coolers. The four large AHUs, the elevator lobby AHU, and glycol loop pumps are located in a penthouse mechanical room. The hot and chilled water pumps and the other small AHU is located in the basement mechanical room.

Most of the space is open office layout with perimeter offices. There are hearing rooms, or small conference rooms, on some of the floors. There is a large cafeteria on the ground level with kitchens and seating. Above the cafeteria is a larger hall for larger groups. On the first floor there is a large two story lobby.

The energy use at Stassen is about 23% lower than the B3 Benchmark, and it receives an approximate Energy Star Score, as an office building, of 86. This means that it is better performing than 86% of other office buildings in the area. With an Energy Star Score this high there is generally not much recommissioning can do cost effectively to save more energy. It is CEEs opinion that Stassen could possibly get an Energy Star Plaque. This process is outlined on the Energy Star website ([http://www.energystar.gov/index.cfm?c=business.bus\\_bldgs](http://www.energystar.gov/index.cfm?c=business.bus_bldgs)).

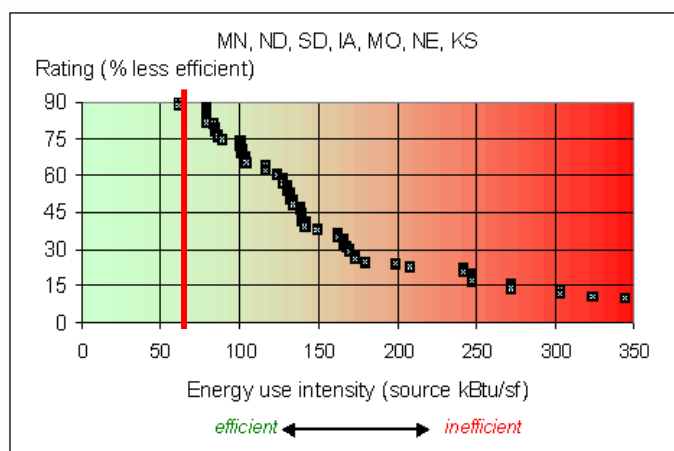


Figure 1 - Ranking of Stassen versus other regional office buildings.

**PBEEEP Screening Report of the Stassen Building****PBEEEP # P12000**

This screening report is based on the PBEEEP Guidelines. It is based on one site visit, review of the facility documentation, building automation system, a limited inspection of the facility and interviews with the staff. The purpose of the screening report is to evaluate the potential of the facility for the implementation of cost-effective energy efficiency savings through recommissioning. To the best of our knowledge the information here is accurate. It provides a high level view of many, but by no means all, of the important parameters of the mechanical equipment in the facility. Because it is the result of a limited audit survey of the facility, it may not be completely accurate.

<b>Stassen Building</b>		<b>State ID# G0231023962</b>			
Area (sq.ft)	454,392	Year Built	1998	Occupancy (hrs/yr)	4,368
<b>HVAC Equipment</b>					
Name	Type	Size	Notes		
AHU-1	VAV with Face and By-Pass Coil	96,000cfm, 200hp SF	Has a Face and By-Pass Heating Coil.		
AHU-2	VAV with Face and By-Pass Coil	96,000cfm, 200hp SF	Has a Face and By-Pass Heating Coil.		
AHU-3	VAV with Face and By-Pass Coil	96,000cfm, 200hp SF	Has a Face and By-Pass Heating Coil.		
AHU-4	VAV with Face and By-Pass Coil	96,000cfm, 200hp SF	Has a Face and By-Pass Heating Coil.		
VAVs	All have reheats, some have fans.	Varies	491 total, 127 are fan powered		
AHU-5	Constant Volume	25,000cfm, 50hp SF	Serves basement pumping and transformer room.		
AHU-6	Constant Volume	4,500cfm, 5hp SF	Serves elevator lobby		
HW Pump	Hot Water Loop	340gpm, 15hp	Two pumps in lead/lag		
CHW Pump	Chilled Water Loop	1150gpm, 40hp	Two pumps in lead/lag		
EF-1	Constant Volume	20,000cfm, 20hp			
EF-2	Constant Volume	20,000cfm, 20hp			
CRAC	Liebert Units		Five Liebert Units for data center. Not controlled by BAS.		
Glycol Pump	Glycol Loop	216gpm, 7.5hp	Serves Liebert Units. Two pumps in lead/lag		
Dry Coolers	Dry Cooler for Glycol Loop (3X)	45,500cfm, 8.75hp (3X)	All three identical units. One is a standby unit.		

## Points on BAS

Name	Points	Notes
AHU-1 AHU-3 AHU-4	SF-S, RF-S, DAT and setpoint, DARH, Cooling Valve Position, Heating Valve Position, Humidifier Valve Position, FBP Damper position, Mixed Air Chamber Pressure and setpoint, MAT and setpoint, OA Damper Position (3X) and cfm, MA Damper position, EA Damper Position, RA cfm, RAT, RARH and setpoint, RA Duct Pressure and setpoint, Economizer and OA setpoint, OAT	
AHU-2	SF-S, RF-S, DAT and setpoint, DARH, DSP and setpoint, Space Static Pressure and setpoint, Cooling Valve Position, Heating Valve Position, Humidifier Valve Position, FBP Damper position, Mixed Air Chamber Pressure and setpoint, MAT and setpoint, OA Damper Position (3X) and cfm, MA Damper position, EA Damper Position, RA cfm, RAT, RARH and setpoint, RA Duct Pressure and setpoint, Economizer and OA setpoint, OAT	
AHU-5 AHU-6	SF-S, DAT and setpoint, Cooling Valve Position, Heating Valve Position, MAT, OA Damper Position, Economizer and OA setpoint, Room Temp and setpoint, OAT	
VAVs	CFM and setpoint, Damper Position, Reheat Valve Position, Room Temp and setpoint (Heating and Cooling), Occupied, fan Status	Some are Fan Powered.
Heating Loop	Pump status and speed, HWDP and setpoint, HWST, reset, and setpoint, HWRT, District Loop HWST and HWRT, HX Valve Position (3X), Heating System Enable OAT	
Cooling Loop	Pump status and speed, CHWDP and setpoint, CHWST, reset, and setpoint, CHWRT, Valve Position (2X), Cooling System Enable OAT	
Glycol Loop	Pump status.	

<b>PBEEP Abbreviation Descriptions</b>			
AHU	Air Handling Unit	HP	Horsepower
BAS	Building Automation System	HRU	Heat Recovery Unit
CD	Cold Deck	HW	Hot Water
CDW	Condenser Water	HWDP	Hot Water Differential Pressure
CDWRT	Condenser Water Return Temperature	HWP	Hot Water Pump
CDWST	Condenser Water Supply Temperature	HWRT	Hot Water Return Temperature
CFM	Cubic Feet per Minute	HWST	Hot Water Supply Temperature
CHW	Chilled Water	HX	Heat Exchanger
CHWRT	Chilled Water Return Temperature	kW	Kilowatt
CHWDP	Chilled Water Differential Pressure	kWh	Kilowatt-hour
CHWP	Chilled Water Pump	MA	Mixed Air
CHWST	Chilled Water Supply Temperature	MA Enth	Mixed Air Enthalpy
CRAC	Computer Room Air Conditioner	MARH	Mixed Air Relative Humidity
CV	Constant Volume	MAT	Mixed Air Temperature
DA	Discharge Air	MAU	Make-up Air Unit
DA Enth	Discharge Air Enthalpy	OA	Outside Air
DARH	Discharge Air Relative Humidity	OA Enth	Outside Air Enthalpy
DAT	Discharge Air Temperature	OARH	Outside Air Relative Humidity
DDC	Direct Digital Control	OAT	Outside Air Temperature
DP	Differential Pressure	Occ	Occupied
DSP	Duct Static Pressure	PTAC	Packaged Terminal Air Conditioner
DX	Direct Expansion	RA	Return Air
EA	Exhaust Air	RA Enth	Return Air Enthalpy
EAT	Exhaust Air Temperature	RARH	Return Air Relative Humidity
Econ	Economizer	RAT	Return Air Temperature
EF	Exhaust Fan	RF	Return Fan
Enth	Enthalpy	RH	Relative Humidity
ERU	Energy Recovery Unit	RTU	Rooftop Unit
FCU	Fan Coil Unit	SF	Supply Fan
FPVAV	Fan Powered VAV	Unocc	Unoccupied
FTR	Fin Tube Radiation	VAV	Variable Air Volume
GPM	Gallons per Minute	VFD	Variable Frequency Drive
HD	Hot Deck	VIGV	Variable Inlet Guide Vanes

**Conversions:**

1 kWh = 3.412 kBtu

1 Therm = 100 kBtu

1 kBtu/hr = 1 MBH